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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/658,042	09/07/2000	Weifang Luo	08935-220001 / M-4931	2542

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EXAMINER	
KALAFUT, STEPHEN J	
ART UNIT	PAPER NUMBER
1745	9

DATE MAILED: 03/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/658,042	LUO ET AL.	
	Examiner	Art Unit	
	Stephen J. Kalafut	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22,24 and 27-34* is/are rejected.

7)☒ Claim(s) *23,25 and 26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5, 6, 8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 8, 16-18 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by either Tomantschger *et al.* (US 5,108,852) or Hanawa *et al.* (US 5,938,798).

Tomantschger *et al.* disclose a cell with a manganese dioxide cathode (column 7, lines 54-62), a zinc anode (column 8, lines 10-13) and an alkaline electrolyte (column 8, lines 20-24). The cathode material may also include carbon fibers (column 8, lines 35-51). Since these materials are the same as those presently recited, the cell would be "primary" to the same extent that the present cell is primary. Regarding claims 16-18, recitations of how the carbon fibers were made are treated under product-by-process practice. See MPEP 2113 and the cases cited therein. The process steps are not given patentable weight unless they are shown to impart some necessary characteristic to the resulting product, which cannot result from other processes. Thus, these claims would be anticipated by Tomantschger *et al.*

Hanawa *et al.* disclose a cell with a manganese dioxide cathode (column 7, lines 5-28), a zinc anode (column 9, lines 7-9) and an alkaline electrolyte (column 9, line 5). The cathode material may also include carbon fibers (column 6, lines 52-59). Since these materials are the same as those presently recited, the cell would be "primary" to the same extent that the present cell is primary. Regarding claims 16-18, recitations of how the carbon fibers were made are treated under product-by-process practice. See MPEP 2113 and the cases cited therein. As

stated above, the process steps are not presently given patentable weight. Thus, these claims would be anticipated by Hanawa *et al.*

Claims 19-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomantschger *et al.*, above.

Tomantschger *et al.* teach that their carbon fibers may be as short as about 100 micron, which would be 100,000 nanometers. This would fall within the ranges recited in claims 19-21. Regarding claim 22, Tomantschger *et al.* disclose graphite fibers (column 8, line 40), which would have one layer of graphite, and thus "between about 1 and about 500 layers of graphite".

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-7 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Tomantschger *et al.* or Hanawa *et al.*, both above.

These claims differ from either Tomantschger *et al.* or Hanawa *et al.* by reciting the amount of carbon fibers or active material within the cathode mixture. The relative amounts of components, however, is considered to be a matter of optimization to the ordinary artisan, who would have to balance out the considerations of electrical conductivity, mechanical stability, and electrical capacity. For example, see Hanawa *et al.*, column 7, lines 29-40, and Tomantschger *et*

al., column 8, lines 48-51. These claims are accordingly considered obvious over either Tomantschger *et al.* or Hanawa *et al.*

Claims 13-15, 24, 27 and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Tomantschger *et al.* or Hanawa *et al.*, each in view of Friend *et al.* (US 5,110,693).

Neither Tomantschger *et al.* nor Hanawa *et al.* disclose carbon fibers having the diameters recited in these claims. However, Friend *et al.* disclose carbon fibrils having diameters between 3.5 and 75 nanometers (column 2, lines 37-39), which exhibit high electrical conductivity, good corrosion resistance in alkaline environments, and high surface area (column 2, lines 28-30). Since both Tomantschger *et al.* and Hanawa *et al.* use their respective carbon for its conductivity, and since both present alkaline environments, it would be obvious to use the carbon fibrils of Friend *et al.* as the carbon component of the cathode mixtures of either Tomantschger *et al.* or Hanawa *et al.* The relative size of the cathode active material to the carbon fibers would be a matter of optimization to the ordinary artisan, since this would affect the relative surface area of the two components, and in turn the ability of the two to transfer electrons between them. Since the surface area of the carbon is related to its diameter, the surface area recitation of claim 24 would inherently accrue to at least some of the fibers.

Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Tomantschger *et al.* or Hanawa *et al.*, each in view of Di Franco (US 5,041,199).

These claims differ from Tomantschger *et al.* or Hanawa *et al.* by reciting a surfactant within the positive electrode. Di Franco discloses cathodes such as MnO_2 which contain carbon and a surfactant (column 3, lines 7-52). Because the surfactants would help the liquid electrolyte to wet the cathode, it would be obvious to use the surfactants of Di Franco in the cathodes of either Tomantschger *et al.* or Hanawa *et al.* While Di Franco lists certain surfactants (column 3, lines 17-42), other types would be known to the ordinary artisan.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 30-34 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for carbon fibers having diameters of less than about 250 nanometers, does not reasonably provide enablement for carbon particles of any possible shape with such a range of diameters. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The present specification is drawn to carbon fibers, but claim 30 does not require its recited carbon to be in fibrous form. Regarding claims 31-34, whether the recited carbon fibers are the same material as the carbon material with the recited diameter, or a separate component is unclear. If the latter, these claims would also include a carbon material, not necessarily fibrous, of the recited diameter range, which is not presently enabled.

Claims 31-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Whether the carbon fibers of these claims are the same material as the "carbon material" of claim 30, only in fibrous form, or a separate component, is unclear.

Claims 23, 25 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. A battery with a cathode containing carbon fibers, where the fibers have plural distinct layers of graphite, the recited surface energy, or the recited graphitic index are not taught by the references applied above, or cited either below or by applicants.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mieczkowska *et al.* (US 5,342,712) disclose anatase titanium dioxide as a conductive additive for a manganese dioxide cathode. Chalilpoyil *et al.* (US 4,777,100) disclose a zinc anode including a surfactant.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is (703) 308-0433. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gabrielle Brouillette can be reached on (703) 308-0756. The fax phone numbers for

the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

sjk
March 4, 2002

STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP 1700